

CPC**COOPERATIVE PATENT CLASSIFICATION****F01M**

LUBRICATING OF MACHINES OR ENGINES IN GENERAL ([lubricating in general F16N](#))

LUBRICATING INTERNAL COMBUSTION ENGINES
CRANKCASE VENTILATING

NOTE

Attention is drawn to the notes preceding class [F01](#) , specially as regards Note (3).

Guide heading:**F01M 1/00****Pressure lubrication**

F01M 1/02

- . using lubricating pumps ([pumps in general F04](#) ; [lubricating pumps per se F16N](#))

F01M 1/04

- . using pressure in working cylinder or crankcase to operate lubricant feeding devices

F01M 1/06

- . Lubricating systems characterised by the provision therein of crankshafts or connecting rods with lubricant passageways, e.g. bores ([crankshafts, connecting-rods, per se F16C](#))

F01M 1/08

- . Lubricating systems characterised by the provision therein of lubricant jetting means

F01M 1/10

- . Lubricating systems characterised by the provision therein of lubricant venting or purifying means, e.g. of filters

F01M 1/12

- . Closed-circuit lubricating systems not provided for in groups [F01M 1/02](#) to [F01M 1/10](#)

F01M 1/14

- . Timed lubrication ([F01M 1/08](#) takes precedence)

F01M 1/16

- . Controlling lubricant pressure or quantity ([rendering machines or engines inoperative or idling on lubricant pressure failure F01M 1/22](#))

F01M 1/18

- . Indicating or safety devices ([concerning lubricant level F01M 11/06, F01M 11/12](#))

F01M 1/20

- . . . concerning lubricant pressure

F01M 1/22

- . . . rendering machines or engines inoperative or idling on pressure failure

F01M 1/24

- acting on engine fuel system

F01M 1/26

- acting on engine ignition system

F01M 1/28

- acting on engine combustion-air supply

F01M 3/00

Lubrication specially adapted for engines with crankcase compression of fuel-air mixture or for other engines in which lubricant is contained in fuel, combustion air, or fuel-air mixture ([separating lubricant from air or fuel-air mixture before entry into cylinder F01M 11/08](#))

F01M 3/02 . with variable proportion of lubricant to fuel, lubricant to air, or lubricant to fuel-air-mixture

F01M 3/04 . for upper cylinder lubrication only

F01M 5/00 **Heating, cooling, or controlling temperature of lubricant** ([arrangement of lubricant coolers in engine cooling system F01P 11/08](#))
lubrication means facilitating engine starting

F01M 5/001 . {Heating }

F01M 5/002 . {Cooling }

F01M 5/005 . {Controlling temperature of lubricant }

F01M 5/007 . . {Thermostatic control }

F01M 5/02 . Conditioning lubricant for aiding engine starting, e.g. heating

F01M 5/021 . . {by heating }

F01M 5/025 . . {by prelubricating, e.g. using an accumulator }

F01M 5/04 . . Diluting, e.g. with fuel

F01M 7/00 **Lubrication means specially adapted for machine or engine running-in**

F01M 9/00 **Lubrication means having pertinent characteristics not provided for in, or of interest apart from, groups [F01M 1/00](#) to [F01M 7/00](#)**

F01M 9/02 . having means for introducing additives to lubricant

F01M 9/04 . Use of fuel as lubricant

F01M 9/06 . Dip or splash lubrication

F01M 9/08 . Drip lubrication

F01M 9/10 . Lubrication of valve gear or auxiliaries

F01M 9/101 . . {of cam surfaces }

F01M 9/102 . . {of camshaft bearings }

F01M 9/103 . . {of valve stem and guide }

F01M 9/104 . . {of tappets }

F01M 9/105 . . {using distribution conduits }

F01M 9/106 . . {Oil reservoirs }

F01M 9/107 . . {of rocker shaft bearings }

F01M 9/108 . . {of auxiliaries }

F01M 9/109 . . {of rotary slide or sleeve valves }

F01M 9/12 . Non-pressurised lubrication, or non-closed-circuit lubrication, not otherwise provided

for

- F01M 11/00** **Component parts, details or accessories, not provided for in, or of interest apart from, groups [F01M 1/00](#) to [F01M 9/00](#)**
- [F01M 11/0004](#) . {Oilsumps }
- [F01M 11/02](#) . Arrangements of lubricant conduits
- [F01M 11/03](#) . Mounting or connecting of lubricant purifying means relative to the machine or engine
Details of lubricant purifying means ([filters B01D](#))
- [F01M 11/04](#) . Filling or draining lubricant of or from machines or engines
- [F01M 11/0408](#) . . {Sump drainage devices, e.g. valves, plugs }
- [F01M 11/045](#) . . {Removing lubricant by suction }
- [F01M 11/0458](#) . . {Lubricant filling and draining }
- [F01M 11/06](#) . Means for keeping lubricant level constant or for accommodating movement or position of machines or engines
- [F01M 11/061](#) . . {Means for keeping lubricant level constant }
- [F01M 11/062](#) . . {Accommodating movement or position of machines or engines, e.g. dry sumps }
- [F01M 11/064](#) . . . {Movement }
- [F01M 11/065](#) . . . {Position }
- [F01M 11/067](#) {inverted, e.g. for inverted flight }
- [F01M 11/08](#) . Separating lubricant from air or fuel-air mixture before entry into cylinder ([separating in general B01D](#))
- [F01M 11/10](#) . Indicating devices
Other safety devices
- [F01M 11/12](#) . . concerning lubricant level
- F01M 13/00** **Crankcase ventilating or breathing**
- [F01M 13/0011](#) . {Breather valves }
- [F01M 13/0033](#) . {Breather inlet-air filters }
- [F01M 13/02](#) . by means of additional source of positive or negative pressure
- [F01M 13/021](#) . . {of negative pressure }
- [F01M 13/022](#) . . . {using engine inlet suction }
- [F01M 13/023](#) {Control valves in suction conduit }
- [F01M 13/025](#) {with an inlet-conduit via an air-filter }
- [F01M 13/028](#) . . {of positive pressure }
- [F01M 13/04](#) . having means for purifying air before leaving crankcase, e.g. removing oil

- F01M 13/0405 . . {arranged in covering members apertures, e.g. caps }
- F01M 13/0416 . . {arranged in valve-covers }
- F01M 13/06 . specially adapted for submersible engines, e.g. of armoured vehicles

Guide heading:

F01M 2001/00

Pressure lubrication

- F01M 2001/02 . using lubricating pumps (pumps in general [F04](#) ; lubricating pumps per se [F16N](#))
- F01M 2001/0207 . . characterised by the type of pump
- F01M 2001/0215 . . . Electrical pumps
- F01M 2001/0223 . . . Electromagnetic pumps
- F01M 2001/023 . . . Piston pumps
- F01M 2001/0238 . . . Rotary pumps
- F01M 2001/0246 . . . Adjustable pumps
- F01M 2001/0253 . . characterised by the pump driving means
- F01M 2001/0261 . . . driven by the camshaft
- F01M 2001/0269 . . . driven by the crankshaft
- F01M 2001/0276 . . . driven by a balancer shaft
- F01M 2001/0284 . . mounting of the pump
- F01M 2001/0292 . . Sealings
- F01M 2001/06 . Lubricating systems characterised by the provision therein of crankshafts or connecting rods with lubricant passageways, e.g. bores ([crankshafts](#), [connecting-rods](#), per se [F16C](#))
- F01M 2001/062 . . Crankshaft with passageways
- F01M 2001/064 . . Camshaft with passageways
- F01M 2001/066 . . Connecting rod with passageways
- F01M 2001/068 . . Balance shaft with passageways
- F01M 2001/08 . Lubricating systems characterised by the provision therein of lubricant jetting means
- F01M 2001/083 . . for lubricating cylinders
- F01M 2001/086 . . for lubricating gudgeon pins
- F01M 2001/10 . Lubricating systems characterised by the provision therein of lubricant venting or purifying means, e.g. of filters
- F01M 2001/1007 . . characterised by the purification means combined with other functions
- F01M 2001/1014 . . . comprising supply of additives
- F01M 2001/1021 . . . comprising self cleaning systems
- F01M 2001/1028 . . characterised by the type of purification
- F01M 2001/1035 . . . comprising centrifugal filters
- F01M 2001/1042 . . . comprising magnetic parts
- F01M 2001/105 . . characterised by the layout of the purification arrangements

F01M 2001/1057	...	comprising a plurality of filters, parallel or serial
F01M 2001/1064	...	comprising drains for oil to the carter, e.g. to recover spilled oil during change of filters
F01M 2001/1071	...	comprising oil tanks
F01M 2001/1078	...	comprising an oil pick-up tube to oil pump, e.g. strainer
F01M 2001/1085	...	comprising non-return valves
F01M 2001/1092	...	comprising valves bypassing the filter
F01M 2001/12	.	Closed-circuit lubricating systems not provided for in groups F01M 1/02 to F01M 1/10
F01M 2001/123	..	using two or more pumps
F01M 2001/126	..	Dry-sumps
F01M 2001/16	.	Controlling lubricant pressure or quantity (rendering machines or engines inoperative or idling on lubricant pressure failure F01M 1/22)
F01M 2001/165	..	according to fuel dilution in oil
F01M 2005/00		Heating, cooling, or controlling temperature of lubricant (arrangement of lubricant coolers in engine cooling system F01P 11/08) lubrication means facilitating engine starting
F01M 2005/002	.	{Cooling }
F01M 2005/004	..	Oil-cooled engines
F01M 2005/008	.	Lubrication means facilitating engine starting
F01M 2005/02	.	Conditioning lubricant for aiding engine starting, e.g. heating
F01M 2005/021	..	{by heating }
F01M 2005/023	...	Oil sump with partition for facilitating heating of oil during starting
F01M 2005/025	..	{by prelubricating, e.g. using an accumulator }
F01M 2005/026	...	with an auxiliary pump
F01M 2005/028	...	with a reservoir under pressure
F01M 2011/00		Component parts, details or accessories, not provided for in, or of interest apart from, groups F01M 1/00 to F01M 9/00
F01M 2011/0004	.	{Oilsumps }
F01M 2011/0008	..	with means for reducing vibrations
F01M 2011/0012	...	with acoustic insulation
F01M 2011/0016	..	with thermic insulation
F01M 2011/002	..	with means for improving the stiffness
F01M 2011/0025	..	with heat exchangers
F01M 2011/0029	..	with oil filters
F01M 2011/0033	..	with special means for guiding the return of oil into the sump
F01M 2011/0037	..	with different oil compartments
F01M 2011/0041	...	for accommodating movement or position of engines

- F01M 2011/0045 . . . for controlling the oil temperature
- F01M 2011/005 . . with special anti-turbulence means, e.g. anti-foaming means or intermediate plates
- F01M 2011/0054 . . Fastening to the cylinder block
- F01M 2011/0058 . . Fastening to the transmission
- F01M 2011/0062 . . Gaskets
- F01M 2011/0066 . . with passages in the wall, e.g. for axles or fluid passages
- F01M 2011/007 . . Oil pickup tube to oil pump, e.g. strainer
- F01M 2011/0075 . . . with a plurality of tubes
- F01M 2011/0079 . . with the oil pump integrated or fixed to sump
- F01M 2011/0083 . . Dry sumps
- F01M 2011/0087 . . Sump being made of different parts
- F01M 2011/0091 . . characterised by used materials

- F01M 2011/0095 . Supplementary oil tank

- F01M 2011/02 . Arrangements of lubricant conduits
- F01M 2011/021 . . for lubricating auxiliaries, e.g. pumps or turbo chargers
- F01M 2011/022 . . for lubricating cylinders
- F01M 2011/023 . . between oil sump and cylinder head
- F01M 2011/025 . . for lubricating gudgeon pins
- F01M 2011/026 . . for lubricating crankshaft bearings
- F01M 2011/027 . . for lubricating connecting rod bearings
- F01M 2011/028 . . for lubricating balance shafts

- F01M 2011/03 . Mounting or connecting of lubricant purifying means relative to the machine or engine
Details of lubricant purifying means ([filters B01D](#))
- F01M 2011/031 . . characterised by mounting means
- F01M 2011/033 . . . comprising coolers or heat exchangers
- F01M 2011/035 . . . comprising oil pumps
- F01M 2011/036 . . . comprising pumps for the cooling circuit
- F01M 2011/038 . . . comprising lubricant-air separators

- F01M 2011/04 . Filling or draining lubricant of or from machines or engines
- F01M 2011/0408 . . {Sump drainage devices, e.g. valves, plugs }
- F01M 2011/0416 . . . Plugs
- F01M 2011/0425 with a device facilitating the change of oil
- F01M 2011/0433 with a device defining the lubricant level during filling
- F01M 2011/0441 for measuring the lubricant level
- F01M 2011/0458 . . {Lubricant filling and draining }
- F01M 2011/0466 . . . Filling or draining during running
- F01M 2011/0475 with combustion of used lubricant in the engine
- F01M 2011/0483 . . with a lubricant cartridge for facilitating the change
- F01M 2011/0491 . . Filing cap with special features

F01M 2011/06	. Means for keeping lubricant level constant or for accommodating movement or position of machines or engines
F01M 2011/062	.. {Accommodating movement or position of machines or engines, e.g. dry sumps }
F01M 2011/065	... {Position }
F01M 2011/068 with internal reservoir
F01M 2011/10	. Indicating devices Other safety devices
F01M 2011/14	.. for indicating the necessity to change the oil
F01M 2011/1406	... by considering acidity
F01M 2011/1413	... by considering dielectric properties
F01M 2011/142	... by considering speed, e.g. revolutions per minute [RPM]
F01M 2011/1426	... by considering distance
F01M 2011/1433	... by considering load
F01M 2011/144	... by considering magnetic properties of the oil
F01M 2011/1446	... by considering pressure
F01M 2011/1453	... by considering oil quantity
F01M 2011/146	... by considering moisture level
F01M 2011/1466	... by considering quantity of soot
F01M 2011/1473	... by considering temperature
F01M 2011/148	... by considering viscosity
F01M 2011/1486	... by considering duration of operation
F01M 2011/1493	... by considering total base number [TBN]
F01M 2013/00	Crankcase ventilating or breathing
F01M 2013/0005	. with systems regulating the pressure in the carter
F01M 2013/0011	. {Breather valves }
F01M 2013/0016	.. with a membrane
F01M 2013/0022	.. electromagnetic
F01M 2013/0027	.. with a de-icing or defrosting system
F01M 2013/0038	. Layout of crankcase breathing systems
F01M 2013/0044	.. with one or more valves
F01M 2013/005	.. having one or more deoilers
F01M 2013/0055	... with a by-pass
F01M 2013/0061	... having a plurality of deoilers
F01M 2013/0066 in parallel
F01M 2013/0072 in series
F01M 2013/0077	. Engine parameters used for crankcase breather systems
F01M 2013/0083	.. Crankcase pressure

- F01M 2013/0088 . . . Rotation speed
- F01M 2013/0094 . . . Engine load
- F01M 2013/02 . . by means of additional source of positive or negative pressure
- F01M 2013/021 . . . {of negative pressure }
- F01M 2013/026 . . . with a pump sucking air or clowby gas from the carter
- F01M 2013/027 . . . with a turbo charger or compressor
- F01M 2013/04 . . having means for purifying air before leaving crankcase, e.g. removing oil
- F01M 2013/0411 . . . using cooling means
- F01M 2013/0422 . . . Separating oil and gas with a centrifuge device
- F01M 2013/0427 . . . the centrifuge device having no rotating part, e..g cyclone
- F01M 2013/0433 . . . with a deflection device, e.g. screen
- F01M 2013/0438 . . . with a filter
- F01M 2013/0444 . . . with means for accomodating movement or position of engines
- F01M 2013/045 . . . using compression or decompression of the gas
- F01M 2013/0455 . . . with a de-icing or defrosting system (for breathing valves [F01M 2013/0027](#))
- F01M 2013/0461 . . . with a labyrinth
- F01M 2013/0466 . . . with electrostatic means
- F01M 2013/0472 . . . using heating means
- F01M 2013/0477 . . . by separating water or moisture
- F01M 2013/0483 . . . using catalysis
- F01M 2013/0488 . . . with oil trap in the return conduit to the crankcase
- F01M 2013/0494 . . . using check valves

Guide heading:

F01M 2250/00 Measuring

- F01M 2250/60 . . Operating parameters
- F01M 2250/62 . . Load
- F01M 2250/64 . . Number of revolutions
- F01M 2250/66 . . Vehicle speed